Notebook Series -- Notebooks by Edison
Notebook, N-14-04-03.1

This notebook was used by Edison during April 1914 and was annotated at least once in 1916. An entry on the first page indicates that the work was done at Edison's laboratory at Fort Myers, Florida. The book consists primarily of 87 numbered entries entitled "Notes on cause of Low % of good disc output." The entries describe ingredients and processes involved in disc record manufacture, identify the potential sources of problems, discuss experiments done by Edison to improve record varnish, and suggest additional experiments to be performed. In entry 58, Edison noted that the problems resulted from variations in the thickness of the blanks and consequent differences in pressure on the transfers at different spots. Following entries 84 and 85 are several pages of notes on separating nickel flake and nickel hydrate recovered from old storage batteries and on a "New Scheme" for the battery. Following entry 86 is a list of eight "things to 1st receive attention" when Edison returned to New Jersey. Near the end of the book is a one-page summary of the results obtained by William W. Dinwiddie in his experiments on the expansion and contraction of Condensite veneer, along with the notation that the information was "Entered in 1916 Book 3." There are also some calculations regarding wages and general expenses. The notes indicate that Sherwood T. (Sam) Moore and Ludwig (Louis) Ott assisted Edison with the disc experiments. The front cover is labeled "Disc Records. Fort Myers. 1914." The pages are unnumbered. Approximately 60 pages have been used.

Ft Myers April 3 1914

Notes on cause of low % of good due output

1 = Temperature of Blank is different from transfer when assembled or one is been made longer than the other with consequently more internal strain.

2 = Penta smoke or smudge may act as a surface lubricator & do good, and when Penta is carried too long in chlorination, smudging malfeasing may be absent or reduced, smudge may allow chips. When we didn't use Penta % very low, cracks but the moment used Penta % went way up, but smudge was great

Probably due to Ferro Chloride in Penta & cause of smudge or Easy leaving plate

3 = Penta chlorination carried too far, too acid, also oxidizes, If oxidized no longer soluble in water, I remember however when we were using white distilled penta & was getting high % suddenly % of transfer went bad without any change in distilled Penta.

4 = Look out for rapid oxidation of Penta I have noticed Penta being thrown out of Varnish on plates while Evaporating. This would tend to segregate Penta, The precipitated Penta shows especially when our strikes Varnish & waves are going on —

5 Too much water gets in the Various materials used for making Varnish, Alcohol Wood powder, Resin, 6/4 —

6 = Formaldehyde in Digester Escapes + makes lower grade of Resin, hence large part of 6/4 added is neutralized —

7 = Edge of Blank in Transfer press is exposed to air + chills quicker + also never reaches Platen Temperature — Center always hotter

8 Some men open water Exit wider than others also Water Entrance End cools quicker than Exit end, gives unequal Contraction
Some steam Valves don't shut tight, steam leaks into cooling water, hence blanks not chilled so quick —

9= Air draughts one day different from other days & temperatures different, Carpet leading in pipes condense steam & get lower steam pressure & temperature by air drafts

13= Ovens cool down from 225 quicker at times & produce strains Cooling with cloth Covered trucks not long Enough & go to press strained

14 Wiping rags in Print room greasy - permits slip on smooth Edge of record when not welded at spots & this starts Crack -

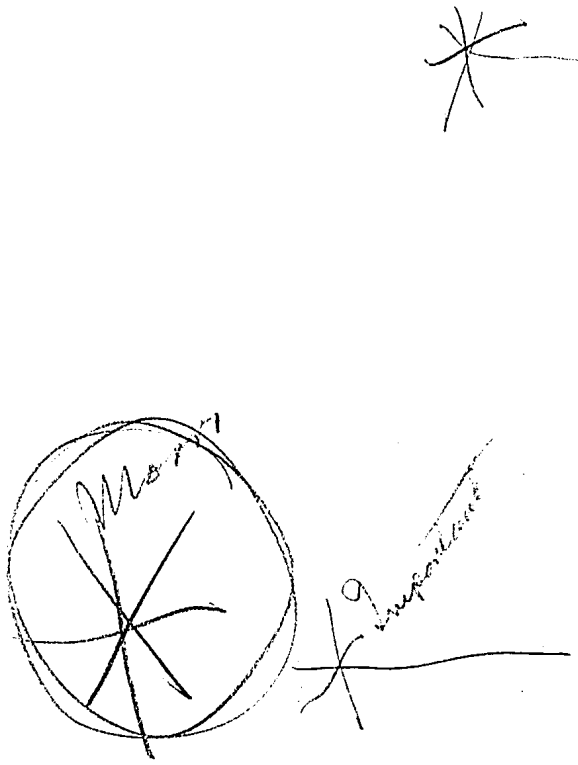
15- Bad Prints not Enough free Phenol & transfer gets too hard making Varnish too hard to flow & fill Wants more free Phenol, is cause bad prints

16 = Penta, oxidizes in mixing Board

17 = Free HCl left in Pentaerythrite on Calyphen & makes harder Varnish so can't flow in printing Must soften Varnish to get free —

18 German S plates have at different times a smudge or residue — absent on other days. This affects transfer — this smudge or residum may have same effect as sesame,

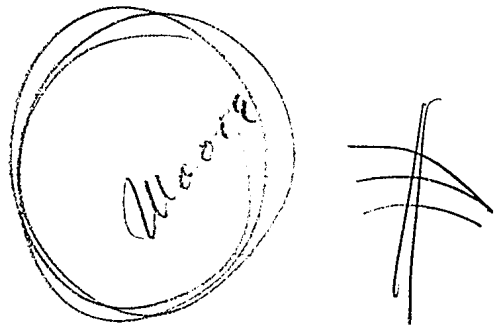
19 To much alcohol used on plates** One condition of Atmosphere & drawing nearly all goes away — other days but little goes off



20 = Without Penta, or Para we get very low % 40 to 50
With Penta some days we get high % next day low %
Effectiveness of Penta depends on some change in process.

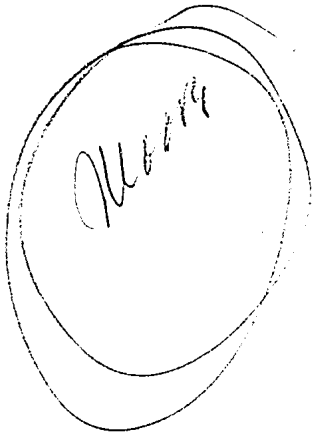
21 - Once we made lot of Varnish with only 2% Para no Penta & got 100% transfer & 100% Print never got anywhere near it again — ~~1% Penta~~

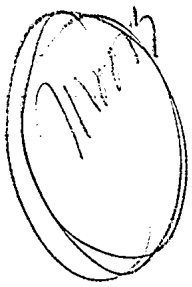
22 Once we made lot varnish using only Para 3% it fered & coent solid in 2 hours in bottle Then reduced it To 2% & this was used in No 21 above. Wethaens old Crude Para Now cant get it to fuse within 24 hours why



23 Very few prints show conspicuous Cracks in Print room - in room next to print room shows 2 or 3 times Cracks then They go to Inspection Dept. & they find 25 @ 30% more This shows that the Veneer is strained & our drawing & handling Causes Cracks - We should put holders in boxes & immediately Records are removed from moulds should be put on holders in boxes & lid put on & held 24 hours before machining to allow strain annealing

24 Grease from hands get on blanks on transfer and on print, the transfer - No weld on transfer. - On transfer no weld on spots & get Crack on prints, no grip on edge at spot & we get cracks



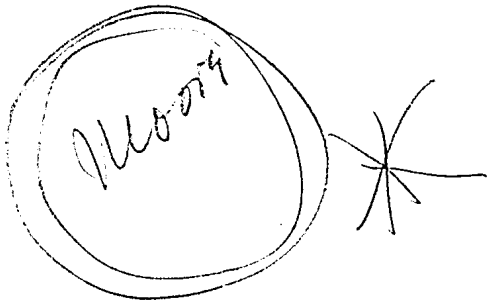


25 If varnish cracks after taking out of Oven by a breath of air + when periodically within a few degrees of the Atmospheric temp – or if out + OK + then put in a draft a little Cooler than room temp + they sometimes crack. Why should not prints crack if exposed to air after coming out of press. Why should they be given time to anneal.

26 After Prints are taken from the mould they are under great strain. Those which are not cracked many will crack depending on position they are placed + air draft should be given chance to anneal.

27- Possibly we should let off the pressure in both Transfer + Print very slowly after Cool, taking 2 or 3 minutes, to no pressure on gauge then rapidly after trial. The sudden relief of press may make a snap, a crack. a thing can be done gradually that will snap if done suddenly —
Also possibly pressure let down with heat as it goes down, especially after Vacuum is off

28- Think we do not water down our press phenol in Vacuum Bellows if proper quantity of blank surface will be soft + flow easy + stop good prints + will wear ok- any great excess will cause diamond to cut



29- Think that screen is very variable as to free phenol & some way of favorably testing the given proper addition should be devised -

30 = The action of 6/4 with proper amount of free phenol in Varnish is to harden the resin very hard & to turn the free phenol into a soft tough Condensate Tough at low temperature If not enough free phenol Veneer is to brittle & hard not plastic enough for our processes If too much only defect will be that Resin will not be hard Enough & free phenol has soft it will give high plasticity & stop bad prints but Decomposes will cut & it will be softened by alcohol

31= Our End March to April probably due to Variable Phenol, when Formaldehyde Escapes we probably get more plastic Varnish if not Cooked properly by Hoffman= if made without loss, its probably too hard & we get poor results.

32 The Reason Para free Varnish quicker at one time than another is due to Variation of free Phenol a low free phenol Content Varnish will be thicker in say 3 hours than it would if Excess free Phenol used —

33 – Blanks vary in amount they will diminish in thickness in Transfer & Print pressure from bad mixing of Varnish or poor baking in Oven they being in different positions

34- Perhaps we should put some free phenol in wood pulp Varnish -
Possibly Pauta & Pana to toughen it + make it semi plastic

35- My chemical Room experiments with 1½" plates with great Excess of phenol show that a surprising Excess of phenol can be used in fact no limit until the resins wears

36= Inclined at Myers that Condensate made direct from phenol & 6/4 is very little affected by KOH, Cold The small % of Cond 2% dissolved out & precipitated by HCl is like spence gum for Chewing — Better try it with hot 25% KOH, if good residue could use as a filler for battery hard rubber

37 It is possible we have too much free phenol & it crystalizes & makes it contract sharply around 110 deg.

38 Perhaps if we need more free phenol that when we have the right amount in varnish it distills off in oven by going to high or keeping it too long at high temp.

39 We should try an excess of phenol & then run at lower temp in oven to prevent distilling off.

40 - Perhaps with our present uncertain amount of free phenol, it would be safer to come down 10% on 6/4 or until it dont cut - then cheapen

41 - We should test our photocoagulating for % + impurities +

42 = Perhaps our screens are getting thin from using varnish of too great viscosity being thin there is no margin of flow to take up irregularities of blank + make good prints.

43 - I notice where draught is strong over varnish plates while baking that the top is very hard + brittle + bottom comparatively much softer, possibly the merely draught in oven is not good -

44 - If we don't grind the blank powder fine the blank will be denser + thinner + by time it reaches print press it won't give + permit a fill - the finer the more difficult it is to hold it.

It has a spring back to it.

45 & In this connection to get a greater spring back to stop poor prints we might try 4½ to 1 instead of 4 to 1 of furnish wood fibre, this will be far more springy & if ground fine, stiff more.

46 Today took
10 grams Anhy Phenol
700 mlg 6/4
1400 mlg Moderately soft Penta
not washed.

Put in dish in Copper oven & over a period of 7 hours got it to 220 — Result was

Original weight	12100 mg
Residue left	5700 "
Loss	6400

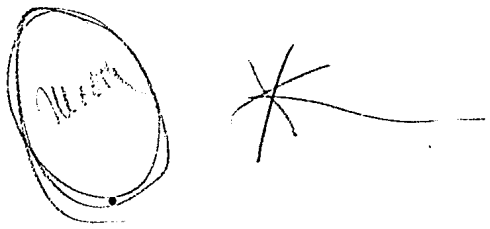
It was solid black brittle resin cold but softened heat of hand & at low temp was very thick

Tar like dough, sticky & tenacious
I think the free phenol in
Reg Var gives this —
It might be a good idea to use
phenol free Resin in Varnish
& then make a lot of about
Tar, add 5 to 10% to Varnish
it certainly would lower
the softening point & prevent
Records Cracking & give a
free flow for pressing —
By liquefying the 6/# in
making the Tar, could get any
result required —

17/= Here is a good scheme:
press record, keep pressure
on, the blank & Veneer will
be cold & not cracked, now
turn water off — put on steam
for few seconds till Veneer
heated up slightly — Cut
off steam & remove
pressure & take out mould
the Veneer will be expanded
more than blank & can't crack

48 – We should get up a water bath oven, & put a test Varnish plate in with a Vicat needle to get the softening point – perhaps immersed in water, & that heated in oven. If a plate with a hard diamond Reader wear test. Then the Varnish that softens nearer say 80 Fahr The less Cracking or poor points –

49 Varnish sent to makers without b/g – acts differently. A whole lime of Varnish, and a random Varnish number & put in Drum. without b/g & kept & when I wanted b/g put in & mixed –



50 - Weather Input into keep plates 24 hours before baking

51 - Perhaps Chloride of o-Phenylene diamin would be better than Base, or acetate

52 Recently Cam mix 10% or so Raw wood pulp time with black powder for blanks & Then get electrodeposited Lamp blacks

53 - New scheme - melting thermoplastic Dip blank mtl, cool, Vacuum over surface of blank in strong alcoholic 6/4 - Para Phenol solution with formic or oxalic acid, dry + prevent dust changing alcohol to condense the surface layer

54 – Test the Varnishing Experiment
Lott is doing –

55 It may be you raise too high & too
long or high Varnishing and
tarry matter so that on transfering
Varnish not plastic enough & also
not enough smudge to render run
or quick surface that will press
the transfer from plate, old
Paula that smudges always
come free

56 – An alcohol manufacture
substance from wiping cloths
may be left on plates & that
makes them come free & this
film stays on transfer block
& helps in printing –

57 – Para once condensed Varnish
in 2 hours Evidently
some impurity did it
What was the impurity –

58= I think we have the trouble -
It is this — The blanks vary in
Calliper several thousandths
on one edge as against
the other, The Top & bottom
of press is flat, if it happens
that more thin edges of blank
occur on the right or near
to each other, the pressures
in transforming are very
different. In other words
these variations in thickness
produce unequal pressures on
one side of blank, & these
bad defect multiplies by
using 12 at once
Our blanks is the process just
as everything has pointed
that way -
Even if Calliper of all blanks
were even this doesn't
argue that when pressure
was on they moved to
even — as in Mfg blanks it
impossible apparently to
make a blank of even density

59 - To get around this Bug
- is going to be deffrent.
We can calliper & place the
Thick ~~side~~ Edge in mould North
& next one South next East.
Next West & so on & the the 12

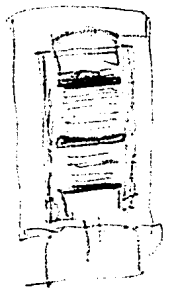
(1) (2) (3) (4) -

Nearly Even - Each blank being
Calliped by a quick comer
instrument at Thick Edge, marked
by white spot on edge -

The only thing that interferes
is the variable density which
is not taken by Calliper.

60 = A false plate & possibly one
platten Removed - Top plate
loose with a ball joint to
get Center pressure & to permit
platens to lift & accomodate
themselves to variable thickness
of the 12 moulds & Platens
combined -

61 = Possibly Can get rid of moulds & patterns — Thus



Assemble 50 blanks with plates of Varnish each side pile them on top each other. Then another 50 — put both in a Tube — Heat by gas & when temp is 350 put on pressure 15 min Keep Temp Constant. Then remove & cool slowly — With thick rubber Collar pressure & Swivel ball — gets Even pressure

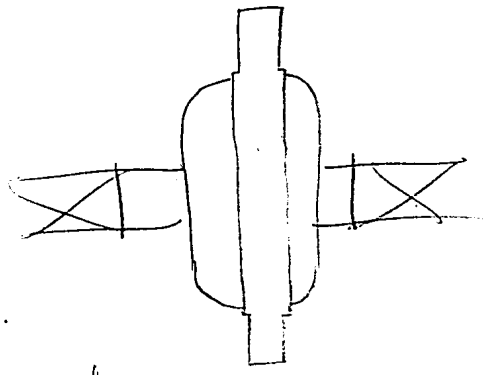
Possibly steam jacket could be used, steam perforated or just Hot Air —

62 - Calipers by a round device - showing high and low weight of blanks then place them in moulding press high end, X S E & West, then weight up press & eliminate spilling too many high ends on one side of press -

63 - Say blank on hot plate use hot conical rollers under great pressure roll & bank out to same thickness -

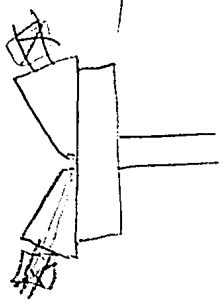
64 Grind one face against Emery wheel or grind & true trued up by Diamonds then clamp a chuck against a face plate chuck claws or taper ring - face with Carborundum wheel or turn with a diamond

65 =



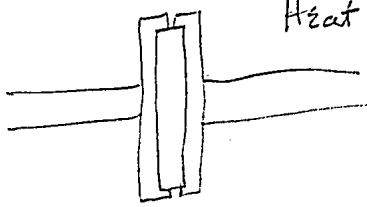
face edge + sides in 1/4 inch
both sides or one side to get
a true bearing to face by —
+ turn both sides with diamond

66 —



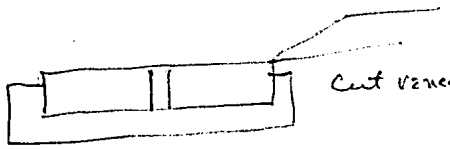
Conical rolls
true up Disc

67 =



Heat hot, put on bag pressure + revolve in opp direction

68 -

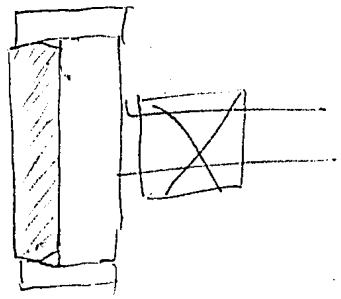


cut veneer off to true blank —

69 = Put in top + bottom of press
One inch top + bottom of adhesive
to permit alignment of platform
with uncovered blanks

70 - 1 ft dia Ball put in top + bottom of press to permit alignment.

71 =



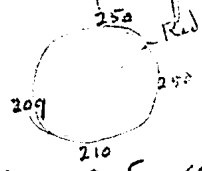
Blank (bevelled) two ways — use chuck + tighten by the taper and edge, face with diamond + then turn off face other side — 400 Rev min — grooves 2 Cone belt Countershaft.

72 — Press a cake 10", 6 long Chuck + saw off disc blanks with diamond saw. Could use a steam jacketed Cylinder for the mould.

73 Use square mould + pack powder same as we pack iron pockets, then cut or punch out discs

74 = Print turn heat off, wait 1/2 min turn mould 1/2 way around + heat + print, then cool -

75 - Calliper blanks, put red mark on edge of center of high side,



chosen 66 N S E + West,

76 = NEW = there is a drag in fading to keep up the pressure in cooling. The mould let the pressure go down from malfunction, then bring it back, sometimes it goes way down before they notice it -

Now suppose 3 sides had most of the pressure + on 1/4 had light pressure. The fall on cooling

Might not be enough to loosen the grip on the heavy pressure point but on the 1/4 of area where pressure is light the grip is small or it will not stop veneer from contracting hence cracking. The only safe way is to not only stop these loss of grip by not losing pressure but would be good to actually increase it.
This probably explains why some men get better 1/2 than others. Even cutting of blanks will stop it.

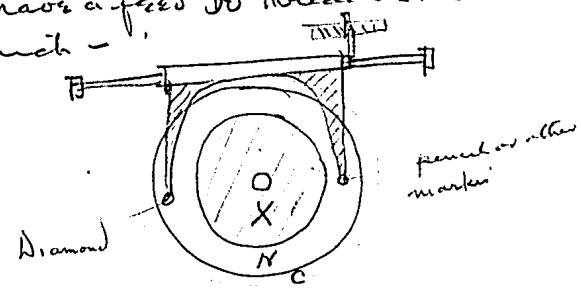
77 = I think that if pressure of a schedule is say 1000 lbs that the moment we see of approaching above slightest lowering to face that it would be well to group events 1100 lbs to cell and this would prevent loss of grip on cohesive surface

78 24 Veneers 15/1000 Each
Can deform down to 8/1000
drop to 22/1000 —

If we have 24 veneers in press
15/1000 thick this is total of 360/1000
of veneer

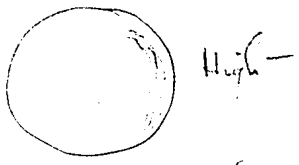
If deformation is necessary to correct
uneven calliper of blanks. 8/1000
on one edge 22/1000 on the other
it gives a deformation to each blank
of 28/1000, or 336/1000 to the
12 blanks —
This requires thick cobestos at top
& bottom to allow alignment of
platens —
Blanks more than 22/1000
thicker at one place than the
other is bad 22/1000 is the limit
and it should not be more
than 11 to 12/1000 —

79 To test blanks for thick + thin edges - rotate blank - have a feed 50 threads or less to inch -



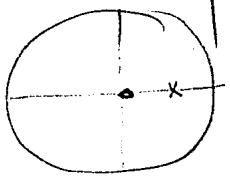
X top plate
C platter
N Record - held down flat,

When low side passes under Diamond the pencil comes down + marks



The idea can be worked up -

80 = In loading use thin



removable metal separator partition. Weigh 4 portions of wood fibre put on in each – Remove X – then whole will be even to start with.

81 In embossing the tits on working mould connect the tits together by a 002 to 004 high 10/100 wide. – Emboss – On printing this will hold the veneer while contracting & in final Edging come off + Dez of bases have not been changed

NG

82= Cracks never start on second part, but only on smooth, its because tenser is not held on Cooling - No 81 should fix this
To stop it at transfer, make a Chaser with 1/8 wide of fine teeth 150 threads & chase the Varnish plates clear to edge this will hold it in process When Cooling on permitting it will not show -
We could chase smooth part of record also, & Miller could track all new ones -
On transfer plates as they are irregular can use an advance Gage like on recording tenser see who owns patent for expanding ring at Edge of rec think it foreign

83 – Possibly we want to run Varnish plates up quickly as possible to reach the nitrating state, then there is no danger of segregation of Pell a Para or 6/4. Then can go slower. Think this the trick to get even Contraction & softness —

84 = Making Veneers —
Used small granules of following in Reg Varnish ~~one~~ poured from Reg Var a small quantity into a separate dish added the Chemical & stirred it then poured on one of the little plates —
Let all stand in air over night & then gradually heat up to 185 —
After being all night in air none fired.

Used $CoSO_4$
Fe Tannate
Fe Picratic
Cu Nitroprusside
Cu Oxalate
Fe Sulfocarbolate
K Sulphite
Ba Sulphide
Aluminum Chloride
Antimony Chloride
Cu Cy
Sulphide Zn
Cu Chloride –

Practically all except Rubbery
around 145° Fahr

SbCl very rubbery
AlCl next "
If pencil pressed in either, no hole
of deformation left, not true of all
the others they come back slowly
+ leave a slight mark,

SbCl is the most abnormal

at the last, AlCl made lots bubbles – SbCl acts + apparently precipitates, turns from black to brown surface not flat or shiny + seems thinner than others, there are internal bubbles which raise up a wrinkled surface of little hills –
All others shiny – Reg the most SbCl least AlCl next,

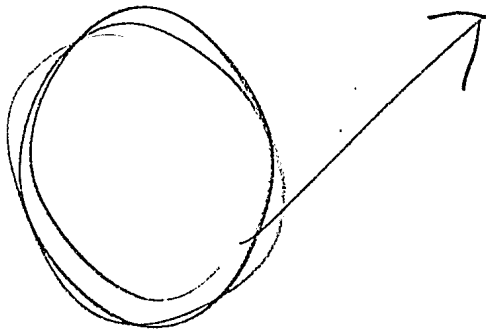
At 160° SbCl still very rubbery all the others very stiff rubbery + all about the same – AlCl probably a shade harder.

185° SbCl still abnormal
Still Rubbery
Reg + CuCy blistered.
Cu Nitroprusside all blistered
Ba Sulfide next hardest to AlCl.
Reg + CuCy smoothest + no bubbles
K Sulfite Cold Cuts Tough, peel like
Separate from plate hard
BaS cuts little tough separates OK

AlCl Whatman plate, cuts semi tough
Comes off hard –
CuCy seems tough & peeritter good
ZnS " "
CuCl – brittle dont separate good
Fe Picronitric brittle, sepo bad
Fe Tannate " " fair
CoSoy Brittle sepo good
Cu Oxal " " only fair
Fe Sulfocarbolate Semi tough sepo fair
11 Reg brittle sepo good
Cu Nitroprusside semi tough Cant sep bubbles
Antimony Chl Trichl – Tough like leather, flexible like leather Cold immersed in alcohol can fold it, KOH dissolving also it Water no effect.

While SbCl3 if coppin than cellulose it Cant be scratched by finger nail – and with a Knife Chal scratches Reg bad dont scratch SbCl. its tough – dont chip out when Knife pressed

Possibly only from LiCl or CaCl, would not



over it, I used altogether too much $SbCl_3$ It's probably probably lengthens it,

If find $SbCl_3$ is precipitated by water, giving white ~~ppt~~ precip "Algaroth" =

$SbCl_3$ dissolves in alcohol there is a precip white from water in alcohol, I filtered the precip off got clear sol then added water big white precip came down +

Evidently when I added the $SbCl_3$ to Rag Varn it took out the water + formed a precipitate in the varnish The white pp turned it from black to brown Comes off plate hard

Something in $SbCl_3$

Juice —

S Battery -

Think Hyposulphite Soda good for depositing, but Impossible. Clean after deposition with 1% H_2SO_4 or perhaps HCl if burned in bath my Experiments shows Clean off flake nicely bright Nickel Bath still black — With HCl for cleaning very little of $NiOH_2$ deposited on black but more in hot H_2SO_4 used

Can use the 1% acid just enough to make mix little thinner than a mush

Can float most flake off by old way of letting water up from Carbonic bottle after the C bag flake Can be screened out The $NiOH_2$ is larger OK for sure —

Next page

85 = further Experiments show that $SbCl_3$ dont lengthen What it does do is to delay the final hardening, by running all up to 180 190 after stripping from plate, they were all bright —

Ferric Chloride was the only one of last lot that was remarkable it Came off the dish perfect not sticking as all others did —

Mixed pinch of each in Reg

Sb S.
Hg S
Cu S
Sn Cl
Bi Salycylate
Ferric Cl
Pb Hyposulphide
Sn Bi Sulfide
4 Strengths of $SbCl_3$
Reg -

I notice when I pour the varnish

Battery -

Contary wind steels are made of ~~Hoff~~ separated metal be boiled in a Cyanide to reduce to green or nat,

Perhaps Hypovolphite the acts to devalate out something forming a double salt,

Perhaps other salts which tend to form double salts will take of another things oil after Hypo has been washed out

Next page

on the little plates, that the $SbCl_3$ shrink very much in Back Thinner same on 1/2 thickness of all the others

at 135, all work condemned to rubbing stale except $SbCl_3$ strongest very very weak $SbCl_3$ was slightly rubbery - the other 3 $SbCl_3$ not bonded

160 fahr all condemned rubbery except strongest $SbCl_3$

15 pounds after being at 200 fahr all hard - ferricchl has dull appearance -

When taken out has had most bubbles, + strong $SbCl_3$ not.

Put them all back a quarter 1 to 2 hours around 190 to 200 - all reached hard 503 condemnate all hard - + about the same in properties -

from these experiments it is

Battery = New Scheme

To make our seq MnO_4H_2 porous use say 1 to 3% H_2SO_4 acid — say the MnO_4H_2, + then just neutralize it with the acid solution, dampen it so to speak. Then practically all the acid will go in the pores if left all day. Then it can be washed out, leaving the MnO_4H porous, any degree of porosity can be attained. Test it.

I noticed when I added on Wake & Sh from old cell by HCl + by H_2SO_4 — + HCl + $AlFe(HNO_3)$ latter gave no black film of coat stuff — whereas H_2SO_4 gave some —

Easy to see that the Gas Times + temperatures are VERY IMPORTANT

to get a tough veneer don't go above 200 + don't hold to long at high temp, + 4 or 5 hours + perhaps longer [illegible] that is required for 1st stage is Rubbery condensation around 140 for 1 or 1½ hours 2nd stage is hardening + driving off alcohol etc, if I opened here, veneer is tough — 3rd stage is hard + brittle 190 @ 200 for say 1 hour

When get back change schedule to get tougher final + stop + hold at 160 stage,

I made some very tough + transparent stuff from using an insufficient of formaldehyde in phenol that absorbed water 24 hours — This ought to be a good addition to Varnish

86 = I feel sure we can make 2nd prints by using condensate veneers on metal & bring to rubbery state & just be ready pour on metal with removable rim – Then print by using hot water, don't think it needs more than 150° or less –

Could also use 1/4 of face mounted in holder flat, flow a condense on of face remove to holder, print, remove & plate,

I think the vem's condensed veneer will take graphite OK if temp has been kept low

When I arrive Home These are things to 1st Receive attention

1st Make experts old Cell mixer operated by 6 def Chemicals Wash + treat with H_2SO_4 – Acetic HCl HNO_3 & Aqua Regia Ni crushed + pulverized screen – test in small tubes Sep flake by Chemical ox + reduction

2nd Develop bat tray + make mechanical tools

3rd Start men on making Even Calipers blanks

4 Extra plus Cu Varnish + Cry need Oven Och tube to get safer results – 190°

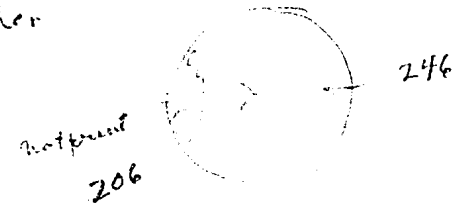
5 Floco Condensate with ring on glass or porcelain or metal held in metal ring – Use it just beyond Rubbery stage Use 150° To prevent

6 = Test phono coax cylinders

7. Music

8 Violin Quiet –

87 = Inspection of prints + transfer
bent by Moore, shaver bent
blanket, one print cross upon
another and one side than the
other



Nearly all prints have two
prints opposite each other

Nearly all cracks start

this

from Edges or edge

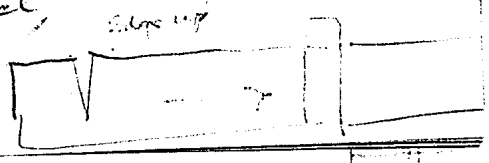
are along as a rule on places showing the paint, not gripped

3 points in minor faces to fill because dents in the Germanischer piles these should be ground out,

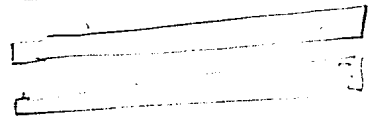
Where grad must be [illegible] such other the diameter of spunk is greater at this point,

Cracks are visible on top, some scrape not [illegible] scratches [illegible] blank [illegible] but they are very narrow [illegible] to be seen

Cracks seemed to be caused by a clinch at Edges, no grip + [illegible] to be to contract,

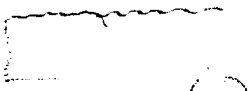


Two seconds gave
poor points Exactly same place —
afterward Kind, showing coming
Second moulds cast right



10½ pound Calliper when weighing
+ Either [illegible] cast or place
afterward Here is another
Chance for Inspection in
Grinder dept —

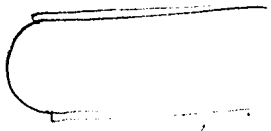
Calliper when measure of
Edge off + the [illegible]
[illegible]



Yet Calliper only 1/3rd of a
1/1000 thousandth — this is
unexplainable —

It looks as if all blanks that will not separate can be either double transfer or turned & separated or double transferred, those that have cracks will not double transfer but can be turned & retransfer put on,

Notice one transfer that has squeezed out round -



Now this shows bad mixing too much in Varnish in fore -

Result of Experiments with Varnish
Reg + Reg with some Viscous
Semi Condensate in — for use in
submarine work —

We can use 1/4" glass, or trued
up porcelain supported in a steel
mould — Flow the glass, porcelain
or metal with a lining around it
like old submarine C type dynamite
Removes ring after drying — Then
put it in Water Jacket oven
~~[illegible]~~ + bring up to 145° @ 160°
for 2 or 4 hours or less — Then
mount in supporting holder +
print at about 120 to 135, Coat it,
Then Graphite it + Electroplate
by Specially filtered Varnish
+ putting in clean oven, filtered
air draft then + no heat for
a while, we shall be able to

discard the d-d Celluloid

Think the Semi Condensate Vaseline like mucks or a muck not acted only 6/4 will be best to help grain filling - not sure, try -

Reg & Reg with Semi Condensate muck

2 hours at	117° Fahr
1	120°
1/2	142°
1/2	160 -

Too soft yet, Cant strip from plate but the one with Condensate muck Comes off

Sections of both when cold are flexible like Leather, The muck one much more than without muck

When very cold Reg Cracks showing that at 160° would answer for submasher - But the mucked one dont crack - ~~but~~ remains flexible + Too soft for submasher

After 1/2 hour Reg Can be stripped some - Top fairly hard, underneath rather leathery

1/2 hour more 178° Fahr Reg seems hard enough for ord dive transfer - sticks hard to plate, Cant pry off but Mucked Var comes off - but hard,

After getting Cooler Reg comes off but hard,

I made the copy Semi Condensate by condensing phenol with very small quantity of formaldehyde, its like Vaseline but quite not so thick -

There is a big difference between
mucked Varnish & Reg

Believe we can work stuff
Var in Oven at 180° Fahr

About 160° is OK for submersion
Mucked Var - Very flexible, Reg OK -

Keeping it at 180° 3 or 4 hours
warm it was unnecessarily hard

180° Fahr Mucked stuff taken
Impression of 10 c piece OK
& looks as if mucked stuff too
Graphite OK -
Only one defect & that is top
of Veneer Very much harder
than the bottom,

142° Fahr Veneer takes graphite OK

Records sent to Ft Myer
april 14 1914

Prints
Def in Calliper
004
014
009
007
015
003
038
033
018
003
014
010
019

Durrerdies Experiments on Contraction
& Expansion Rey Condensate
Vanear

Temp	Contracts	
192°	.0345	} 0.001 per degree
175	0329	
150	0320	00036
127	0309	00047
100	0299	00037
78	0295	00017

Vanear takes permanent set as low as 125° @ 130 with only 10 gram loads to ½ inch strip 2½" long but time must be allowed

On cooling the ebonite is greater than the contraction from 135° to 121° after this it contracts 0006 in 2½" when to 100 after 13 minutes more = Tends ~~[illegible]~~ at 100° is Enormous, at 60° 200 to a Rubber jelly

Entered in 1916 Book 3

Wages + Gen'l Exp

$1016 per day

Blank 5.8.

Wkg M 1.0

68

2000	64.8
3000	40.7
4000	32.2
5000	29.8
6000	23.7
7000	21.3

2000) 1016.00 (5.8

3000) 10160 (33.9

4000) 10160 (25.4

7000) 10160 (14.5

5000) 10160 (2.30

6000) 10160 (169

169
68
23.7

Transfer Blank 5.8

14.5
64
21.3

25

12500

748.00
268
1016

748
26
4488
1496
1944
6981
26429

268

68
3000
204000

7000) 204000 (2

26) 6981 (268
52
178
156
221
208